

WATANABE

Tokyo, Japan

Page 6

WHAT IS CLAIMED IS:

1. (Amended) A power transmission system which has a power synthesizing mechanism [connected in a power transmitting manner to] for synthesizing powers outputted from an electric motor and a power generator, and a speed change mechanism (for) changing the rotating speed of said electric motor to transmit a torque of the electric motor] for augmenting a torque transmitted from the electric motor to said power synthesizing mechanism, comprising:

an arranging region for said electric motor and an arranging region for said power generator in the axial directions of the output shaft of said electric motor and the rotary shaft of said power generator, and

an engine connected to the synthesizing mechanism,

wherein the engine, the synthesizing mechanism, the speed changing mechanism and the electric motor are arranged on a common axis and said arranging regions do not overlap on each other.

2. A power transmission system according to Claim 1,

wherein the output shaft of said electric motor is arranged in the transverse direction of a vehicle.

3. A power transmission system according to Claim 1,

wherein said power synthesizing mechanism includes a planetary gear mechanism having: a sun gear; a ring gear arranged on the outer side of said sun gear; and a carrier for holding a pinion gear meshing with said sun gear and said ring gear.

WATANABE

Tokyo, Japan

Page 7

4. A power transmission system according to Claim 1,

wherein said speed change mechanism includes a planetary gear mechanism having: a sun gear; a ring gear arranged on the outer side of said sun gear; and a carrier for holding a pinion gear meshing with said sun gear and said ring gear.

5. A power transmission system according to Claim 4,

wherein said speed change mechanism has any of said sun gear, said ring gear and said carrier fixed so that the torque of said electric motor is increased by said speed change mechanism and transmitted to said power synthesizing mechanism.

6. A power transmission system according to Claim 1,

wherein said power synthesizing mechanism includes a first planetary gear mechanism having: a first sun gear; a first ring gear arranged on the outer side of said first sun gear; and a first carrier for holding a first pinion gear meshing with said first sun gear and said first ring gear, and

wherein said speed change mechanism includes: a second planetary gear mechanism having: a second sun gear; a second ring gear arranged on the outer side of said second sun gear; and a second carrier for holding a second pinion gear meshing with said second sun gear and said second ring gear; and a fixing mechanism for increasing the torque of said electric motor by fixing any of said second sun gear, said second ring gear and said second carrier, to transmit the increased torque to said power synthesizing mechanism.

WATANABE

Tokyo, Japan

Page 8

7. A power transmission system according to Claim 6,
wherein the first carrier of said first planetary gear mechanism and an engine are connected to each other, wherein said electric motor and the second sun gear of the second planetary gear mechanism are connected to each other, wherein the second carrier of said second planetary gear mechanism is fixed, and wherein the first ring gear of said first planetary gear mechanism and the second ring gear of said second planetary gear mechanism are connected to each other.

8. A power transmission system according to Claim 6, further comprising:

a first holding member for holding the first ring gear of said first planetary gear mechanism and the second ring gear of said second planetary gear mechanism rotatably, and arranged on the outer side of said first ring gear and said second ring gear.

9. A power transmission system according to Claim 8, further comprising:

an arranging region for said first holding member and an arranging region for said electric motor,

wherein at least a portion of the arranging region for said first holding member and at least a portion of the arranging region for said electric motor overlap on each other in the axial direction of the output shaft of said electric motor.

10. A power transmission system according to Claim 7, further

WATANABE

Tokyo, Japan

Page 9

comprising:

a rotary member for connecting said engine and said first carrier and is arranged on the same axis as the output shaft of said electric motor.

11. (Amended) A power transmission system according to Claim 1, further comprising:

a rotary member offset in the radial direction with respect to the output shaft of said electric motor and connected to [said] an engine.

12. A power transmission system according to Claim 11, further comprising,

a first gear connected to the output shaft of said electric motor, and wherein said speed change mechanism includes an internal gear, and wherein said first gear is arranged in the inside space of said internal gear and meshes with said internal gear.

13. A power transmission system according to Claim 12, further comprising:

a second holding member for holding said internal gear rotatably and is arranged on the outer side of said internal gear.

14. A power transmission system according to Claim 13, further comprising:

an arranging region for said second holding member, wherein at least a portion of the arranging region for said second holding member and at least a portion of the arranging region for said

WATANABE

Tokyo, Japan

Page 10

electric motor overlap on each other in the axial direction of the output shaft of said electric motor.

15. (Amended) A power transmission system according to Claim [11] 7, further comprising:

a second gear made rotatable together with said first ring gear, wherein the output shaft of said engine is connected to said first sun gear, and

wherein said speed change mechanism includes said second gear, and a third gear for transmitting the power of said electric motor to said second gear.

16. (Amended) A power transmission system according to Claim [11] 7, further comprising:

a fourth gear made rotatable together with said first ring gear; and a fifth gear made rotatable together with said fourth gear, wherein the output shaft of said engine is connected to said first sun gear,

wherein said speed change mechanism includes said fourth gear, and a sixth gear for transmitting the power of said electric motor to said fourth gear, and

wherein the power of said first ring gear and the power of said fourth gear are synthesized so that the synthesized power is transmitted through said fifth gear to wheels.

17. (Amended) A power transmission system according to Claim [11] 7,

WATANABE

Tokyo, Japan

Page 11

further comprising:

a seventh gear made rotatable together with said first ring gear; and

an eighth gear mesh with said seventh gear,

wherein said speed change mechanism includes said eighth gear, and
a ninth gear for transmitting the power of said electric motor to said eighth gear, and

wherein the power of said seventh gear and the power of said ninth gear are synthesized so that the synthesized power is transmitted through said eighth gear to wheels.

18. A power transmission system according to Claim 1,

wherein a space for separating the arranging region for said electric motor and the arranging region for said power generator is formed between said electric motor and said power generator in the axial direction, and
arranges said power synthesizing mechanism and said speed change mechanism therein.

19. A power transmission system according to Claim 1, further comprising:

a wound transmission member made to run on the output member of said power synthesizing mechanism and an intermediate rotary member;

a differential arranged concentrically with said intermediate rotary member; and

a decelerating planetary gear mechanism arranged concentrically with said intermediate rotary member and said differential and, when transmitting the power of the intermediate rotary member to the differential,

WATANABE

Tokyo, Japan

Page 12

transmitting the power by decelerating the rotating speed of the power.

20. A power transmission system according to Claim 18, further comprising:

a wound transmission member made to run on the output member of said power synthesizing mechanism and an intermediate rotary member;

a differential arranged concentrically with said intermediate rotary member; and

a decelerating planetary gear mechanism arranged concentrically with said intermediate rotary member and said differential and, when transmitting the power of the intermediate rotary member to the differential, transmitting the power by decelerating the rotating speed of the power.

21. (New) A power transmission system which has a power synthesizing mechanism connected in a power transmitting manner to an electric motor and a power generator, and a speed change mechanism for changing the rotating speed of said electric motor to transmit a torque of the electric motor to said power synthesizing mechanism, comprising:

an arranging region for said electric motor and an arranging region for said power generator in the axial directions of the output shaft of said electric motor and the rotary shaft of said power generator,

wherein said arranging regions do not overlap on each other,

wherein said power synthesizing mechanism includes a first planetary gear mechanism having: a first sun gear; a first ring gear arranged on the outer side of said first sun gear; and a first carrier for holding a first pinion gear meshing with said first sun gear and said first ring gear and

WATANABE

Tokyo, Japan

Page 13

connected to an engine, and

wherein said speed change mechanism includes: a second planetary gear mechanism having: a second sun gear connected to the electric motor; a second ring gear arranged on the outer side of said second sun gear and connected to the first ring gear; and a second carrier for holding a second pinion gear meshing with said second sun gear and said second ring gear; and a fixing mechanism for increasing the torque of said electric motor by fixing any of said second sun gear, said second ring gear and said second carrier, to transmit the increased torque to said power synthesizing mechanism.

22. (New) A power transmission system which has a power synthesizing mechanism connected in a power transmitting manner to an electric motor and a power generator, and a speed change mechanism for changing the rotating speed of said electric motor to transmit a torque of the electric motor to said power synthesizing mechanism, comprising:

an arranging region for said electric motor and an arranging region for said power generator in the axial directions of the output shaft of said electric motor and the rotary shaft of said power generator,

wherein said arranging regions do not overlap on each other,

wherein said power synthesizing mechanism includes a first planetary gear mechanism having: a first sun gear; a first ring gear arranged on the outer side of said first sun gear; and a first carrier for holding a first pinion gear meshing with said first sun gear and said first ring gear,

wherein said speed change mechanism includes: a second planetary gear mechanism having: a second sun gear; a second ring gear arranged on

WATANABE

T kyo, Japan

Page 14

the outer side of said second sun gear; and a second carrier for holding a second pinion gear meshing with said second sun gear and said second ring gear; and a fixing mechanism for increasing the torque of said electric motor by fixing any of said second sun gear, said second ring gear and said second carrier, to transmit the increased torque to said power synthesizing mechanism, and

wherein the first ring gear of said first planetary gear mechanism and the second ring gear of said second planetary gear mechanism are rotatably held by a first holding member which is arranged on the outer side of said first ring gear and said second ring gear.

23. (New) A power transmission system according to Claim 22, further comprising:

an arranging region for said first holding member and an arranging region for said electric motor,

wherein at least a portion of the arranging region for said first holding member and at least a portion of the arranging region for said electric motor overlap on each other in the axial direction of the output shaft of said electric motor.

24. (New) A power transmission system according to Claim 21, further comprising:

a rotary member for connecting said engine and said first carrier and is arranged on the same axis as the output shaft of said electric motor.

25. (New) A power transmission system according to Claim 21, further

WATANABE

Tokyo, Japan

Page /5

comprising:

a rotary member offset in the radial direction with respect to the output shaft of said electric motor and connected to said engine.

26. (New) A power transmission system according to Claim 21, further comprising,

a first gear connected to the output shaft of said electric motor, and wherein said speed change mechanism includes an internal gear, and wherein said first gear is arranged in the inside space of said internal gear and meshes with said internal gear.

27. (New) A power transmission system according to Claim 26, further comprising:

a second holding member for holding said internal gear rotatably and is arranged on the outer side of said internal gear.

28. (New) A power transmission system according to Claim 27, further comprising:

an arranging region for said second holding member, wherein at least a portion of the arranging region for said second holding member and at least a portion of the arranging region for said electric motor overlap on each other in the axial direction of the output shaft of said electric motor.

29. (New) A power transmission system according to Claim 21, further comprising:

WATANABE

Tokyo, Japan

Page 16

a second gear made rotatable together with said first ring gear,
wherein the output shaft of said engine is connected to said first sun
gear, and

wherein said speed change mechanism includes said second gear, and
a third gear for transmitting the power of said electric motor to said second
gear.

30. (New) A power transmission system according to Claim 21, further
comprising:

a fourth gear made rotatable together with said first ring gear; and
a fifth gear made rotatable together with said fourth gear,
wherein the output shaft of said engine is connected to said first sun
gear,

wherein said speed change mechanism includes said fourth gear, and
a sixth gear for transmitting the power of said electric motor to said fourth
gear, and

wherein the power of said first ring gear and the power of said fourth
gear are synthesized so that the synthesized power is transmitted through
said fifth gear to wheels.

31. (New) A power transmission system according to Claim 21, further
comprising:

a seventh gear made rotatable together with said first ring gear; and
an eighth gear mesh with said seventh gear,

wherein said speed change mechanism includes said eighth gear, and
a ninth gear for transmitting the power of said electric motor to said eighth

WATANABE

Tokyo, Japan

Page 17

gear, and

wherein the power of said seventh gear and the power of said ninth gear are synthesized so that the synthesized power is transmitted through said eighth gear to wheels.

32. (New) A power transmission system which has a power synthesizing mechanism connected in a power transmitting manner to an electric motor and a power generator, and a speed change mechanism for changing the rotating speed of said electric motor to transmit a torque of the electric motor to said power synthesizing mechanism, comprising:

an arranging region for said electric motor and an arranging region for said power generator in the axial directions of the output shaft of said electric motor and the rotary shaft of said power generator,

a wound transmission member made to run on the output member of said power synthesizing mechanism and an intermediate rotary member;

a differential arranged concentrically with said intermediate rotary member; and

a decelerating planetary gear mechanism arranged concentrically with said intermediate rotary member and said differential and, when transmitting the power of the intermediate rotary member to the differential, transmitting the power by decelerating the rotating speed of the power,

wherein said arranging regions do not overlap on each other.

33. (New) A power transmission system which has a power synthesizing mechanism connected in a power transmitting manner to an electric motor

WATANABE

Tokyo, Japan

Page 18

and a power generator, and a speed change mechanism for changing the rotating speed of said electric motor to transmit a torque of the electric motor to said power synthesizing mechanism, comprising:

an arranging region for said electric motor and an arranging region for said power generator in the axial directions of the output shaft of said electric motor and the rotary shaft of said power generator,

a wound transmission member made to run on the output member of said power synthesizing mechanism and an intermediate rotary member;

a differential arranged concentrically with said intermediate rotary member; and

a decelerating planetary gear mechanism arranged concentrically with said intermediate rotary member and said differential and, when transmitting the power of the intermediate rotary member to the differential, transmitting the power by decelerating the rotating speed of the power.

wherein said arranging regions do not overlap on each other, and

wherein a space for separating the arranging region for said electric motor and the arranging region for said power generator is formed between said electric motor and said power generator in the axial direction, and arranges said power synthesizing mechanism and said speed change mechanism therein.